

10010828-1

RECEIVED
CENTRAL FAX CENTER
SEP 20 2006

10/617,547

REMARKS

This is a full and timely response to the non-final Official Action mailed June 20, 2006. Reconsideration of the application in light of the above amendments and the following remarks is respectfully requested.

Claim Status:

Claims 19-26 and 51-72 were withdrawn from consideration under a previous Restriction Requirement. To expedite prosecution of this application, claims 19-26 and 51-72 have been cancelled herein. The withdrawn claims are cancelled without prejudice or disclaimer. Applicant reserves the right to file any number of continuation or divisional applications to the withdrawn claims or to any other subject matter described in the present application.

By the forgoing amendment, claim 1 has been amended. The amendment to claim 1 is made, not to distinguish the prior art, but merely to clarify the language of the claim. Consequently, the amendment to original claim 1 herein does not, and is not intended to, narrow or change the scope of the amended claim.

Additionally, new claims 73-93 have been added. Thus, claims 1-18, 27-50 and 73-93 are currently pending for further action.

Prior Art:

The recent Office Action rejected claims 1, 2, 5-9, 27, 28, 29 and 40 as anticipated under 35 U.S.C. § 102(e) by U.S. Patent Application Pub. No. 2005/0217178 to Aoyama ("Aoyama"). For at least the following reasons, this rejection is respectfully traversed.

10010828-1

10/617,547

In the first place, Applicant notes that Aoyama is not valid prior art under §102(e) against the present application. Aoyama is a published patent application that was filed December 20, 2004, more than a year after the July 10, 2003 filing date of the present application.

Aoyama does claim the priority of a PCT application, PCT/JP03/06662, filed May 28, 2003. However, this date cannot be relied upon when applying the Aoyama reference as prior art under § 102(e) for at least two reasons. First, PCT/JP03/06662 is entitled "Fluid Pressure Cylinder and Clamping Device," assigned to the Koganei Corporation and lists Akio Nakata as the first-named inventor. (See WO 03/102429, copy attached).

In contrast, the Aoyama reference is entitled "Fuel Reforming Device" and is assigned to Nissan Motor Co. Consequently, it appears that the citation to PCT/JP03/06662 in the Aoyama reference is in error. It does not appear possible that the Aoyama reference can claim priority from PCT/JP03/06662.

Additionally, PCT/JP03/06662 was originally published in Japanese, not English. § 102(e) does not apply to a PCT priority dates unless the PCT application is published in English. (See § 102(e)).

For all of these reasons, Aoyama cannot be applied under § 102(e) against the present application. Therefore, the rejection based on Aoyama should be reconsidered and withdrawn.

However, even if Aoyama were valid prior art against the present application, Aoyama does not anticipate the claimed subject matter. Specifically, claim 1 recites "an electronically controllable drop ejection device in fluid communication with an electrochemical cell, the drop ejection device capable of conveying quantities of a chemical composition capable of oxidative reaction into the electrochemical cell."

10010828-1

10/617,547

In contrast, Aoyama teaches a fuel injector (1) that injects fuel, not into an electrochemical cell, but into a fuel reforming device. (Aoyama, paragraph 0022). Reformed fuel from the reforming device (5, 20) is then piped (17) to a fuel cell stack (14). (Aoyama, Fig. 10, paragraph 0116). Consequently, Aoyama does not appear to teach the claimed "drop ejection device capable of conveying quantities of a chemical composition capable of oxidative reaction into the electrochemical cell." Aoyama teaches a fuel injector that is employed to provide fuel to a reforming device rather than an electrochemical cell.

"A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least this additional reason, the rejection of claim 1 and its dependent claims based on Aoyama should be reconsidered and withdrawn

Independent claim 27 recites:

An electrochemical system comprising:
an electrochemical cell capable of sustaining at least one oxidation reaction process; and
a fuel supply apparatus delivering a composition containing at least one compound capable of oxidative reaction into the electrochemical cell, the fuel supply apparatus comprising at least one electronically controllable drop ejection device and at least one fluid storage chamber.

As demonstrated above, Aoyama does not anticipate a fuel supply apparatus that comprises a drop ejection device delivering a composition into an electrochemical cell. Moreover, as demonstrated above, Aoyama is not valid prior art against the present application. For at least these reasons, the rejection of claim 27 and its dependent claims should be reconsidered and withdrawn.

10010828-1

10/617,547

Claims 3, 4, 10-13, 30-39, 43, 44, 47-49 and 50 were rejected as being unpatentable under 35 U.S.C. § 103(a) over the combined teachings of Aoyama and U.S. Patent App. Pub. No. 2002/0022171 to Saito et al. ("Saito"). This rejection is respectfully traversed for at least the same reasons given above with respect to claim 1, including that Aoyama is not valid prior art against the present application.

Additionally, claim 4 recites "wherein the drop ejection device is configured to affect proportionate delivery of the byproduct of oxidative reaction and the chemical composition capable of oxidative reaction into contact with the electrochemical cell." As noted above, the fuel injector taught by Aoyama feeds a fuel reformer rather than directly feeding a fuel cell stack. Consequently, the cited combination of prior art does not appear to teach or suggest the subject matter of claim 4.

Claim 10 recites "a first electronically controllable drop ejection device is in fluid communication with a first composition capable of oxidative reaction and a second electronically controllable drop ejection device is in fluid communication with at least one second composition capable of admixture with the first chemical composition in a manner which facilitates the oxidative reaction." In contrast, the Office Action has identified only the single fuel injector taught by Aoyama as a candidate for the claimed drop ejection device. The Office Action has failed to indicate how or where the cited prior art teaches first and second drop ejection devices as recited in claim 10.

Claim 12 depends from claim 10 and recites "an admixer in fluid communication with the drop ejection devices, the admixer configured to receive the materials and convey admixed materials to the electrochemical cell." The Office Action has failed to indicate how or where the cited prior art teaches the claimed admixer in communication with first *and* second drop ejection devices as recited in claim 12.

10010828-1

10/617,547

Claim 30 recites "wherein the fuel supply apparatus comprises at least two fluid storage chambers, the fluid storage chambers containing materials utilized in the oxidative reaction process occurring in the electrochemical cell." Claim 50 recites similar subject matter. The Office Action has failed to indicate how or where the cited prior art teaches at least two fluid storage chambers communicating with an electronically controllable drop ejection device as recited in claims 30 and 50.

Claim 32 recites "wherein the composition containing at least one chemical component capable of undergoing oxidative reaction is contained in a first fluid storage chamber and wherein a second fluid storage chamber contains at least one compound which is complementary to the oxidative process occurring in the electrochemical cell." The Office Action has failed to indicate how or where the cited prior art teaches this subject matter.

Claim 35 recites "further comprising at least one sensor detecting a product of the oxidative reaction occurring in the electrochemical cell." In this regard, the Office Action refers to Aoyama. (Action of 6/20/06, p. 5). However, Aoyama teaches a temperature sensor located in the fuel reforming device, *not* the fuel cell stack as claimed. (Aoyama, paragraph 0043).

For at least these additional reasons, the rejection of these claims should be reconsidered and withdrawn.

Claims 14-17, 41 and 42 were rejected as being unpatentable under 35 U.S.C. § 103(a) over the combined teachings of Aoyama and U.S. Patent No. 5,746,985 to Takahashi ("Takahashi"). This rejection is respectfully traversed for at least the same reasons given above with respect to claim 1, including that Aoyama is not valid prior art against the present application.

10010828-1

10/617,547

Additionally, claim 14 recites “wherein the electronically controllable drop ejection device comprises a resistor surface having at least one catalytic material positioned thereon, the catalytic material reactive with a component in the chemical composition capable of oxidative reaction to effect at least partial catalytic reforming of the component of the chemical composition.” Claims 16 and 41 recite similar subject matter. Applicant notes that the resistor surface with the catalytic material is recited in the claims as being in the drop ejection device. Emphasizing this point, claim 15 further recites “wherein catalytic reforming occurs prior to exit from the drop ejection device.”

The Office Action acknowledges that Aoyama fails to teach or suggest the subject matter of claim 14 and so cites to Takahashi. (Action of 6/20/06, p. 6). Takahashi teaches “a heating resistor disposed inside a reforming reactor.” (Takahashi, col. 2, lines 63-64). Takahashi further teaches that the heating resistor can be embedded in a catalyst. (Takahashi, col. 3, lines 3-5). However, Takahashi does not teach or suggest such a reactor disposed in a drop ejection device as claimed. To the contrary, one seeking to combine the teachings of Aoyama and Takahashi would be lead to use the resistor taught by Takahashi in the fuel reforming device taught by Aoyama, not in the fuel injector taught by Aoyama. Consequently, the combination of Takahashi and Aoyama fails to teach or suggest all the features of claims 14-17, 41 and 42.

For at least these additional reasons, the rejection of claim s 14-17, 41 and 42 should be reconsidered and withdrawn.

Claims 18, 45 and 46 were rejected as being unpatentable under 35 U.S.C. § 103(a) over the combined teachings of Aoyama, Saito and Takahashi. This rejection is respectfully

10010828-1

10/617,547

traversed for at least the same reasons given above with respect to claim 1, including that Aoyama is not valid prior art against the present application.

Additionally, claim 18 recites "wherein the drop ejection device further comprises a resistor, the resistor having a surface which is reactive with a component of the second chemical composition." Claim 45 similarly recites "wherein the jetting device further comprises at least one resistor surface, the resistor surface having at least one catalytic material positioned thereon, the catalytic material reactive with at least one component of the fuel to initiate at least partial catalytic reforming of at least one component of the fuel prior to entry into the electrochemical cell.'

In contrast, as demonstrated above, the Office Action relies on Takahashi for a teaching of a resistor that comprises a reactive surface. (Action of 6/20/06, p. 7). However, the cited prior art fails to teach or suggest that such a resistor is incorporated into a drop ejection device as claimed. For at least this additional reason, the rejection of claims 18, 45 and 46 should be reconsidered and withdrawn.

10010828-1

10/617,547

Conclusion:

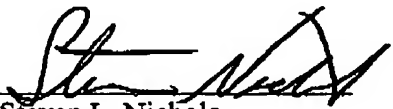
The newly added claims are thought to be patentable over the prior art of record for at least the same reasons given above with respect to the original independent claims.

Therefore, examination and allowance of the newly added claims is respectfully requested.

For the foregoing reasons, the present application is thought to be clearly in condition for allowance. Accordingly, favorable reconsideration of the application in light of these remarks is courteously solicited. If the Examiner has any comments or suggestions which could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number listed below.

Respectfully submitted,

DATE: September 20, 2006


Steven L. Nichols
Registration No. 40,326

Steven L. Nichols, Esq.
Managing Partner, Utah Office
Rader Fishman & Grauer PLLC
River Park Corporate Center One
10653 S. River Front Parkway, Suite 150
South Jordan, Utah 84095
(801) 572-8066
(801) 572-7666 (fax)

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted to the Patent and Trademark Office facsimile number **871-273-8300** on **September 20, 2006**. Number of Pages: **24**


Rebecca R. Schow